Supplemental material

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Supplemental materials

Yoshioka T, Shinozaki T, Hori A, Okawa S, Nakashima K, Tabuchi T. Association between exposure to secondhand-aerosol from heated tobacco products and respiratory symptoms among current nonsmokers in Japan: a cross-sectional study

Table S1 Multivariable Poisson regression analysis using ordinal exposure variables
Table S2 Variance inflation factors for the evaluation of multicollinearity
Figure S1 Flow diagram of the study

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Table S1 Multivariable Poisson regression analysis using ordinal exposure variables

Characteristics	N = 18,839	Asthma/asthma-like attacks			Persistent cough		
		PR	95% CI	*P* value	PR	95% CI	*P* value
Exposure to secondhand aerosols	Never		Reference			Reference	
	Rarely	1.38	1.01–1.88	0.05	1.48	1.20–1.83	<0.001
	Sometimes	1.65	1.30–2.11	<0.001	1.31	1.06–1.63	0.01
	Frequently	1.44	0.99–2.10	0.06	1.69	1.10–2.60	0.02
Age	15–29	1.36	1.02–1.82	0.04	1.01	0.78–1.30	0.94
	30–44	1.14	0.89–1.47	0.28	1.15	0.96–1.38	0.14
	45–59		Reference			Reference	
	60–80	0.86	0.64–1.15	0.31	1.13	0.91–1.40	0.28
Sex	Male		Reference			Reference	
	Female	0.92	0.74–1.15	0.46	1.11	0.92–1.35	0.27
Education status	High school or less		Reference			Reference	
	College or more	1.04	0.85–1.27	0.70	0.93	0.74–1.16	0.50
Marital status	Married		Reference			Reference	
	Not married	1.03	0.81–1.30	0.82	0.97	0.77–1.21	0.77
	Widowed/divorced	1.61	1.04–2.48	0.03	1.39	0.93–2.07	0.11
Household size	Living alone		Reference			Reference	
	Living with others	0.84	0.60–1.19	0.33	1.14	0.81–1.61	0.47
Household-equivalent income	1st quartile		Reference			Reference	
	2nd quartile	0.81	0.62–1.07	0.14	0.89	0.66–1.21	0.46
	3rd quartile	0.89	0.63–1.26	0.51	0.76	0.56–1.05	0.10
	4th quartile	0.87	0.65–1.18	0.38	0.92	0.69–1.22	0.56
	Unknown/declined to answer	0.72	0.53–0.98	0.03	0.80	0.60–1.08	0.14
Combustible cigarette use	Never		Reference			Reference	
	Past	0.94	0.71–1.22	0.63	1.17	0.88–1.55	0.29
HTP use	Never		Reference			Reference	
	Past	1.70	1.19–2.43	0.004	1.35	1.05–1.73	0.02
Other tobacco product use	Never		Reference			Reference	
	Past	1.35	0.96–1.91	0.08	1.41	1.08–1.85	0.01
Exposure to secondhand smoke over the past month	Absent		Reference			Reference	
	Present	0.86	0.67–1.11	0.25	0.97	0.78–1.21	0.81
Asthma	Absent		Reference			Reference	
	Present	12.31	9.68–15.65	<0.001	4.13	3.14–5.42	<0.001
Bronchitis or pneumonia	Absent		Reference			Reference	
	Present	1.68	1.20–2.36	0.002	2.04	1.46–2.84	<0.001

Note. PR: prevalence ratio, CI: confidence interval, HTP: heated tobacco product.

The sampling weights, which were scaled such that the total amounted to 26,000 (the original number of respondents), were predicted from a logistic model in which we adjusted for area of residence, marital status, education status, home-ownership status, self-rated health, and smoking status in individuals aged 20–80 years; and area of residence, education status, home-ownership status, and self-rated health (omitting marital and smoking status) in individuals aged 15–19 years, to adjust for the difference in respondents between the current internet survey and the 2016 Comprehensive Survey of Living Conditions in Japan. All CIs and *P* values were based on the robust variance estimator to account for the inverse-probability weighting.

Table S2 Variance inflation factors for the evaluation of multicollinearity

Characteristics	N = 18,839	VIF
Exposure to secondhand aerosols	Absent	Reference
	Present	1.07
Age	15–29	1.78
	30–44	1.49
	45–59	Reference
	60–80	1.68
Sex	Male	Reference
	Female	1.19
Education status	High school or less	Reference
	College or more	1.06
Marital status	Married	Reference
	Not married	2.01
	Widowed/divorced	1.31
Household size	Living alone	Reference
	Living with others	1.48
Household-equivalent income	1st quartile	Reference
	2nd quartile	1.63
	3rd quartile	1.65
	4th quartile	1.68
	Unanswered	1.66
Combustible cigarette use	Never	Reference
	Past	1.40
HTP use	Never	Reference
	Past	1.19
Other tobacco product use	Never	Reference
	Past	1.31
Exposure to secondhand smoke over the past month	Absent	Reference
	Present	1.03
Asthma	Absent	Reference
	Present	1.09
Bronchitis or pneumonia	Absent	Reference
	Present	1.10
Mean		1.41

Note. VIF: variance inflation factor, CI: confidence interval, HTP: heated tobacco products.

Figure S1 Flow diagram of the study

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┌─────────────────────────────────────┐
│   All respondents of the survey      │
│             in 2021                  │
│           n = 26,000                 │
└─────────────────────────────────────┘
                 │
                 │──────────────────────►┌──────────────────────────────────────┐
                 │                        │ Excluded                             │
                 │                        │   Meeting the exclusion criteria     │
                 │                        │                        n = 2,858     │
                 ▼                        └──────────────────────────────────────┘
┌─────────────────────────────────────┐
│       Eligible respondents           │
│           n = 23,142                 │
└─────────────────────────────────────┘
                 │
                 │──────────────────────►┌──────────────────────────────────────┐
                 │                        │ Excluded                             │
                 │                        │   Current tobacco product user:      │
                 │                        │     Combustible cigarettes  n = 3,138│
                 │                        │     Heated tobacco products n = 1,020│
                 │                        │     Other tobacco products  n = 145  │
                 ▼                        └──────────────────────────────────────┘
┌─────────────────────────────────────┐
│        Study participants            │
│           n = 18,839                 │
└─────────────────────────────────────┘
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